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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/605,271	06/28/2000	Christopher Henry Rohrs	200308340-1	5332

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IP ADMINISTRATION , LEGAL DEPARTMENT  
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EXAMINER

ABEL JALIL, NEVEEN

ART UNIT

PAPER NUMBER

2165

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/605,271

Applicant(s)

ROHRS, CHRISTOPHER HENRY

Examiner

Neveen Abel-Jalil

Art Unit

2165

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 24-September -2004 has been entered.

2. The amendment filed on 24-September -2004 has been received and entered. Claims 1-26 are pending.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1-3, 6-11, 14-19, and 22-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Garthwaite (U.S. Pub. No2002/0161792 A1).

As to claims 1, 9, 17, and 25-26, Garthwaite discloses a collector for collecting non-referenced objects stored in a heap by a program executing in a computer system comprising:

an object allocation routine which stores an object of a particular type in one of a plurality of logical partitions in the heap dependent on a predefined category assigned to the object type, such that each object of a certain category is stored in one logical partition of the heap and objects of a category different from the certain category are stored in a logical partition different from the one logical partition (See Garthwaite page 7, paragraph 0090, also see Garthwaite page 8, paragraphs 0091-0093); and

a collection routine which searches one of the logical partitions of the heap for objects to which references are made and reclaims non-referenced objects stored in the searched logical partition of the heap (See Garthwaite page 6, paragraph 0063).

As to claims 2, 10 and 18, Garthwaite discloses further comprising:

a sample and logical partition routine which defines a category of an object stored in the heap logical partition to be hot or cold (See Garthwaite page 10, paragraph 0110, also see Garthwaite page 4, paragraphs 0038-0039).

As to claims 3, 11 and 19, Garthwaite discloses wherein upon determining that a hot logical partition is full, the collection routine searches a cold logical partition and the hot logical

partition for referenced objects and moves referenced objects of the hot category stored in the hot logical partition to the cold logical partition (See Garthwaite page 6, paragraphs 0059-0065, also see Garthwaite page 9, paragraphs 0101-0102).

As to claims 6, 14 and 22, Garthwaite discloses wherein the sample and partition routine defines the object category dependent on object type mortality (See Garthwaite page 9, paragraphs 0106-0108).

As to claims 7, 15 and 23, Garthwaite discloses wherein the sample and partition routine estimates the object mortality dependent on difference of the number of bytes of the object type stored in the heap before a collection and the number of bytes of the object type stored in the heap after the collection (See Garthwaite page 9, paragraphs 0103-0104).

As to claims 8, 16 and 24, Garthwaite discloses wherein the sample and partition routine partitions the heap to minimize intergenerational pointers between a hot logical partition and a cold logical partition (See Garthwaite page 10, paragraph 0111).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4, 5, 12, 13, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garthwaite (U.S. Pub. No2002/0161792 A1) in view of Ebrahim et al. (U.S. Patent No. 5, 930, 807).

As to claims 4, 12 and 20, Garthwaite does not teach a write barrier elimination routine, which eliminates a write barrier for an intergenerational pointers between an object stored in a hot logical partition and an object stored in a cold logical partition.

Ebrahim et al. teaches a write barrier elimination routine, which eliminates a write barrier for an intergenerational pointers between an object stored in a hot logical partition and an object stored in a cold logical partition (See Ebrahim et al. column 8, lines 11-57, also see Ebrahim et al. column 12, lines 38-51, also see Ebrahim et al. column 13, lines 1-35).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Garthwaite to include a write barrier elimination routine, which eliminates a write barrier for an intergenerational pointers between an object stored in a hot logical partition and an object stored in a cold logical partition.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Garthwaite by the teaching of Ebrahim et al. to include a write barrier elimination routine, which eliminates a write barrier for an intergenerational pointers between an object stored in a hot logical partition and an object stored in a cold logical partition because it provides for faster processing by reducing memory overhead.

As to claims 5, 13 and 21, Garthwaite as modified discloses wherein the write barrier elimination routine eliminates a write barrier by replacing a write barrier machine code instruction with a no operation machine code instruction (See Ebrahim et al. column 8, lines 11-57, also see Ebrahim et al. column 12, lines 38-51, also see Ebrahim et al. column 13, lines 1-35, also see Ebrahim et al. column 10, lines 6-25).

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's argument that "the cited reference does not teach performing garbage collection based on the type of objects" is not deemed to be persuasive.

The Examiner refers to applicant's recitation of claim 6 which is dependent on claim 1 in re-stating the applicant's exact claimed narrowing limitation of "defines the object category dependent on object type mortality" which is precisely what generational garbage collection technology is based on, simply the elimination of objects grouped together by age (which is a type shared between those objects). Therefore, any cited references containing generational garbage collection broadly read on the claimed limitation.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kolodner et al. (U.S. Pub. No. 2001/0000821 A1) teaches on the fly garbage collector.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neveen Abel-Jalil whose telephone number is 571-272-4074. The examiner can normally be reached on 8:30AM-5:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici can be reached on 571-272-4038. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Neveen Abel-Jalil  
June 21, 2005



**CHARLES RONES**  
**PRIMARY EXAMINER**